

A2 CC1 Q3 Quarter Test Review Key

$$\begin{array}{r}
 2x+1 \\
 1) \quad 3x-5 \overline{) 6x^2-7x-5} \\
 \underline{-(6x^2-10x)} \downarrow \\
 3x-5 \\
 \underline{-(3x-5)} \\
 0
 \end{array}$$

$$2x+1 + \frac{0}{3x-5}$$

$$\begin{array}{r}
 2) \quad x-2=0 \\
 x=2
 \end{array}
 \quad
 \begin{array}{r}
 2 \overline{) 1 \quad -3 \quad -10 \quad 24} \\
 \underline{ 2 \quad -2 \quad -24}
 \end{array}$$

$$\begin{array}{r}
 1 \quad -1 \quad -12 \quad 0 \\
 x^2 - 1x - 12
 \end{array}
 \quad
 \textcircled{0} \leftarrow \text{Remainder is 0 therefore } (x-2) \text{ is a factor}$$

$$\boxed{(x-4)(x+3)} \leftarrow \text{Other factors}$$

$$3) \quad 3(1)^{107} + 14(1)^{35} - 16(1) = \boxed{1}$$

If we divide by $(x-1)$ then
plug in +1

$$\begin{array}{r}
 4) \quad (x+3)=0 \\
 x=-3
 \end{array}
 \quad
 \begin{array}{r}
 f(-3) = (-3)^3 + (-3)^2 - 5(-3) + 3 \\
 = -27 + 9 + 15 + 3
 \end{array}$$

$$= 0 \text{ Therefore } (x+3) \text{ is a factor}$$

$$5) \quad (x+16) \text{ then } x+16=0$$

$$\begin{array}{r}
 -16 \quad -16 \\
 \hline
 \boxed{x = -16}
 \end{array}$$

is a zero

$$6) f(x) = (x-3)(2x-1)(3+x)$$

$$\begin{array}{l|l|l} x-3=0 & 2x-1=0 & 3+x=0 \\ x=3 & \frac{+1}{2} \frac{+1}{2} & x=-3 \\ & 2x=1 & \\ & x=\frac{1}{2} & \end{array}$$

$$x = -3, \frac{1}{2}, 3$$

$$7) f(8)=0 \text{ Then } (x-8) \text{ is a factor.}$$

$$8) f(x) = x^3 + 2x^2 - 8x$$

$$x(x^2 + 2x - 8)$$

$$x(x+4)(x-2)$$

$$9) x = -1 \quad x = -2 \quad x = -3$$

$$(x+1) \quad (x+2) \quad (x+3)$$

$$f(x) = (x+1)(x+2)(x+3)$$

$$10) f(x) = \sqrt{x-8}$$

$$x-8 \geq 0$$

$$+8 \quad +8$$

$$x \geq 8$$

$$11) f(x) = \frac{1}{\sqrt{x-2}}$$

$$x-2 > 0$$

$$+2 \quad +2$$

$$x > 2$$

$$12) f(x) = \frac{1}{x^2 - 16} \quad x^2 - 16 \neq 0$$

$$(x+4)(x-4) \neq 0$$

$$\boxed{x \neq -4 \quad x \neq 4}$$

$$13) f(x) = 3x+1 \quad g(f(x)) = g(3x+1) = (3x+1)^2 - 3$$

$$g(x) = x^2 - 3 \quad (3x+1)(3x+1) - 3$$

$$9x^2 + 3x + 3x + 1 - 3$$

$$\boxed{9x^2 + 6x - 2}$$

$$14) f(x) = x^2 - 3$$

$$g(x) = 5x - 4$$

$$(g \circ f)(3) = f(3) = 3^2 - 3 = 9 - 3 = 6$$

$$g(6) = 5(6) - 4$$

$$= 30 - 4$$

$$= \boxed{26}$$

$$15) f(x) \text{ T.P.} = (5, -8)$$

$$\begin{array}{r} -7 \quad -3 \\ \hline -2, -11 \end{array}$$

$$g(x) = f(x+7) - 3$$

\uparrow \nwarrow
 Subtract Subtract
 7 from x 3 from y

$$\boxed{g(x) \text{ T.P.} = (-2, -11)}$$

$$16) g(x) = f(3x)$$

\uparrow
 Divide
 x-values
 by 3

$$f(x) \text{ x-intercepts are}$$

$$x = \frac{-9}{3} \quad x = \frac{3}{3}$$

$$g(x) \text{ x-intercepts are } \boxed{-3, 1}$$

17) B is not a function because the x-value of 3 occurs twice

$$18) g(x) = f(2x) - 3$$

- 1) horizontal compression by a factor of 2
- 2) vertical shift down 3

$$(-12, 4)$$

$$\begin{aligned} -12 \div 2 &= -6 \\ 4 - 3 &= 1 \end{aligned}$$

$$g(x) \text{ has } \boxed{(-6, 1)}$$

$$19) f(x) = -(x-8)^2 + 5$$

- 1) shift right 8 units
- 2) Reflect over the x-axis
- 3) Shift up 5 units